

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: BELAIR ET AL.

Application No. 10/722,314

Confirmation No. 9299

Filed: November 25, 2003

Group Art Unit: 2195

Examiner: ZHE, Meng Yao

For: GANG SCHEDULING AMONG ONE OR MORE COMPONENTS OR SYSTEMS

APPEAL BRIEF

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

On October 9, 2008, Appellant appealed from the final Office action mailed June 11, 2008. Appellant submits this Appeal Brief with the fee for submitting this Appeal Brief being provided via EFS-Web. Appellant has further submitted a petition for an extension of time. Appellant further authorizes the Commissioner to charge Deposit Account No. 501430 with any additional fees due in connection with the submission of this paper, and petitions for any additional extension of time which may be deemed necessary.

Moreover, all pending claims are supported by the originally filed disclosure, recite patentable subject matter, and the prior art of record neither teaches nor suggests all the elements/limitations of any pending claim. Therefore, all pending claims are believed to be allowable, and the application is considered in good and proper form for allowance. Appellant respectfully requests all claim rejections be reversed and all claims be allowed. Additionally, Appellant requests the Office withdraw all rejections and/or objections and allow the case in response to this reply to the final Office action

(i) REAL PARTY IN INTEREST

The above-identified application has been assigned to Cisco Technology, Inc. by the all inventors, with this assignment recorded in the USPTO at Reel 014755, Frame 0263, with a recordation date of November 25, 2003.

(ii) RELATED APPEALS AND INTERFERENCES

None.

(iii) STATUS OF CLAIMS

Claims 1-19 are pending in the application.

No claims stand as canceled.

No claims stand as objected to.

Claims 1-19 stand as rejected.

Claims 1-19 are on appeal in the application.

(iv) STATUS OF AMENDMENT

NONE.

(v) SUMMARY OF CLAIMED SUBJECT MATTER

There are three independent claims on appeal, claims 1, 8 and 12, related to gang scheduling among one or more components or systems. There are many embodiments described in the extensive specification and illustrated in the large number of figures, and only one or some of these embodiments is/are described herein in relation to each independent claim on appeal as required by the Rules.

Independent claim 1 is a method claim reciting patentably distinct limitations which are performed by a plurality of gang members for one of the gang members causing an operation to be performed approximately or actually simultaneously. One embodiment is described in relation to FIG. 1A described at least from page 10, line 17 to page 15, line 27, FIG. 2A described at least from page 20, lines 9-25, FIG. 2B described at least from page 20, line 26 to page 21, line 2, and FIG. 3 described at least from page 21, line 3 to page 30, line 27. Claim 1 recites limitations, including: a first member (100 of FIG. 1A, page 10, lines 17-18) of a gang recognizing an event (process block 204 of FIG. 2A, page 20, lines 12-15), the gang including the first member (100 of FIG. 1A, page 10, lines 17-18) and a plurality of other members (112-114 of FIG. 1A, page 10, lines 17-18). In response to said recognition of the event, the first member sending a multicast dispatch message to the plurality of other members (process block 214 of FIG. 2A, page 20, lines 21-23), the multicast dispatch message (250 of FIG. 2B, page 20, line 26 to page 21, line 2) including an indication of a gang priority level (253 of FIG. 2B, page 20, line 28). The plurality of other members receiving the multicast dispatch message (process block 304 of FIG. 3, page 21, lines 5-7). In response: each particular member of the plurality of other members raising a priority level of a process associated with said each particular member to that corresponding to the gang priority level in order to cause an approximate or actual simultaneous response to the gang dispatch message on each of the plurality of other gang members (process block 312 of FIG. 3, page 21, lines 10-13), and then performing an operation associated with the multicast dispatch message in said process at the gang priority level (process block 314 of FIG. 3, page 21, lines 13-21).

Independent claim 8 is an apparatus claim written in means plus function format reciting patentably distinct limitations, with the apparatus including a plurality of gang members for one of the gang members causing an operation to be performed approximately or actually simultaneously. One embodiment is described in relation to FIG. 1A described at least from page 10, line 17 to page 15, line 27, FIG. 2A described at least from page 20, lines 9-25, FIG. 2B described at least from page 20, line 26 to page 21, line 2, and FIG. 3 described

at least from page 21, line 3 to page 30, line 27. Additionally, each of FIG. 1C described at least from page 16, line 20 to page 17, line 2, and FIG. 1D described at least from page 17, line 3 to page 19, line 28, illustrates/describes the structure of one or more embodiments. Independent claim 8 recites limitations including: means for maintaining gang membership of a scheduling gang, said gang membership including a plurality of other gang members (gang members 100, 112-114 of FIG. 1A, page 10, lines 17-18, configured to create and/or join gang: process block 202 of FIG. 2A, page 20, lines 11-12; process block 302 of FIG. 3, page 21, line 5; processing architecture 180 of FIG. 1D, page 17, line 3 to page 19, line 28); means for dispatching and communicating gang dispatch messages to the plurality of other gang members (gang members 100, 112-114 of FIG. 1A, page 10, lines 17-18, configured to perform process block 214 of FIG. 2A, page 20, lines 21-23), said gang dispatch messages (250 of FIG. 2B, page 20, line 26 to page 21, line 2) including a scheduling priority level (253 of FIG. 2B, page 20, line 28). Each of the plurality of other gang members (112-114 of FIG. 1A, page 10, lines 17-18) includes: means for receiving a particular gang dispatch message (gang members 112-114 of FIG. 1A, page 10, lines 17-18, configured to perform process block 304 of FIG. 3, page 21, lines 5-7); and means for: in response to said receipt of said particular gang dispatch message: modifying a priority level of a process to the scheduling priority level included in said received gang dispatch message in order cause an approximate or actual simultaneous response to the gang dispatch message on each of the plurality of other gang members (gang members 112-114 of FIG. 1A, page 10, lines 17-18, configured to perform process block 312 of FIG. 3, page 21, lines 10-13) , and then performing an operation corresponding to said particular gang dispatch message in the process at the scheduling priority level included in said particular gang dispatch message (gang members 112-114 of FIG. 1A, page 10, lines 17-18, configured to perform process block 314 of FIG. 3, page 21, lines 13-21).

Independent claim 12 is an apparatus claim reciting patentably distinct limitations, with the apparatus including a plurality of gang members for one of the gang members

causing an operation to be performed approximately or actually simultaneously. One embodiment is described in relation to FIG. 1A described at least from page 10, line 17 to page 15, line 27, FIG. 2A described at least from page 20, lines 9-25, FIG. 2B described at least from page 20, line 26 to page 21, line 2, and FIG. 3 described at least from page 21, line 3 to page 30, line 27. Additionally, each of FIG. 1C described at least from page 16, line 20 to page 17, line 2, and FIG. 1D described at least from page 17, line 3 to page 19, line 28, illustrates/describes the structure of one or more embodiments. Independent claim 12 recites limitations including: one or more processing elements and memory (101 and 102 of FIG. 1A, page 11, lines 14-17), wherein said memory stores one or more instructions that, when executed by said one or more processors, implements processes comprising: a first member of a gang (100 of FIG. 1A, page 10, lines 17-18); and a plurality of other members of the gang (112-114 of FIG. 1A, page 10, lines 17-18). The first member is configured to recognize an event (process block 204 of FIG. 2A, page 20, lines 12-15), and in response, send a multicast dispatch message to the plurality of other members (process block 214 of FIG. 2A, page 20, lines 21-23), the multicast dispatch message (250 of FIG. 2B, page 20, line 26 to page 21, line 2) including an indication of a gang priority level (253 of FIG. 2B, page 20, line 28). The plurality of other members (112-114 of FIG. 1A, page 10, lines 17-18) are each configured to receive the multicast dispatch message (process block 304 of FIG. 3, page 21, lines 5-7). In response to said receipt of the multicast dispatch message: to change a processing priority level of a process to that corresponding to the gang priority level including in the multicast dispatch message in order to cause an approximate or actual simultaneous response to the gang dispatch message on each of the plurality of other gang members (process block 312 of FIG. 3, page 21, lines 10-13), and then to perform an operation associated with the multicast dispatch message in the process at the gang priority level (process block 314 of FIG. 3, page 21, lines 13-21).

(vi) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The issues presented on appeal are listed below, and then addressed in corresponding subheadings hereinafter. Although there are additionally reasons that all claims are patentably distinct over the prior art of record, Appellants have elected solely for the purposes of this Appeal Brief to limit the issues to the issues listed below and discussed *infra*. Appellants respectfully request the Board reverse all rejection/objections.

(1) Whether claims 8-11 are unpatentable as being directed to non-statutory subject matter.

(2) Whether claims 1-19 are unpatentable under 35 USC § 112, second paragraph as being unpatentable for failing to particularly point out and distinctly claim the subject matter which Appellants regard as their invention.

(3) Whether claims 1, 8 and 12 (all three pending independent claims) are anticipated under 35 USC § 102(e) as being anticipated by Chen, US Patent Application 09/989,474, published as US Patent Application Publication 2003/0097425 A1.

(4) Whether claims 1-19 (all pending claims) are unpatentable under 35 USC § 103(a) over Sikdar, US Patent 6,724,729, in view of Boudnik et al., US Patent 7,207,040.

(vii) ARGUMENT

(1) Whether claims 8-11 are unpatentable as being directed to non-statutory subject matter.

Claims 8-11 are apparatus claims written in means-plus-function format reciting patentable subject matter when properly construed, such as consistent with the controlling claim construction performed by the Federal Circuit in *State Street Bank & Trust Co. v. Signature Financial Group Inc.*, 47 USPQ2d 1596 (Fed. Cir. 1998) ("*State Street Bank*").

Group: claims 8-11.

Representative claim for this group: claim 8.

Claims 8-11 stand rejected as being directed to unpatentable subject matter as the Office construes these claims to be comprised of "software alone". Office action, June 11, 2008, page 2. The Office cites page 11 of Appellants' original disclosure, but the Office fails to point out precisely where the disclosure states that an embodiment is pure software, and Appellants can find no such a teaching.

Appellants respectfully traverse these § 101 rejections as construing claim 8-11 to be pure software would NOT be a proper construction of thereof. Appellants note that FIG. 1A, described at least from page 11, line 5 to page 12, line 4, illustrates various hardware configurations, including one embodiment that is configured using software/firmware, etc. But software/firmware etc. in such a scenario would only be a *partial means* for doing the recited function, and that a proper claim construction of the "means for" apparatus claim limitations of claim 8 would be, for example, hardware configured to perform the recited function. The apparatus claim limitations, written in means plus function format, recite "means for ...", not "partial means for...". Appellants liken the Office's claim construction to the facially absurd construction of a limitation of claim 8 to be simply power (as the computer system of one embodiment requires a power source), a wire, or a capacitor. These components

may be part of an embodiment of a "means for" limitation of claim 8, but they do not provide a means for fully performing the function of a recited limitation of claim 8; and therefore, would not be a proper construction of a "means for" limitation of claim 8. Equally, software without request hardware is not a "means for" performing anything (and cannot perform anything without requisite hardware); rather it is only a partial means of an embodiment including the hardware configured to operate according to the software.

Appellants further submit that this position is consistent with the Federal Circuit in *State Street Bank & Trust Co. v. Signature Financial Group Inc.*, 47 USPQ2d 1596, 1599 (Fed. Cir. 1998) ("*State Street Bank*"). *State Street Bank* is an important precedential case discussing what is patentable subject matter. In *State Street Bank*, the Federal Circuit construed the limitations of the claim at issue of not merely to be directed to software, but to be apparatus claims (i.e., "second means" was properly construed to be "an arithmetic logic circuit configured to retrieve information from a specific file...", and not "software for retrieving information from a specific file..."). *Id.*

For at least these reasons, Appellants respectfully submit that a proper claim construction of claim 8, consistent with the Federal Circuit in *State Street Bank* for its apparatus claims, excludes merely software; but rather requires apparatus limitations, such as, but not limited to, one or more processors and memory configured to perform operations according to computer-readable medium containing computer-executable instructions. In other words, not "partial means for..." (e.g., software), but "means for..." (e.g., hardware operating according to software) in one embodiment.

For at least these reasons, Appellants respectfully request the Board reverse the § 101 rejection of claim 8 (as well as for its dependent claims 9-11).

(2) Whether claims 1-19 are unpatentable under 35 USC § 112, second paragraph as being unpatentable for failing to particularly point out and distinctly claim the subject matter which Appellants regard as their invention.

Claims 1-19 comply with 35 USC § 112 as the following limitation is not indefinite: "the plurality of other members receiving the multicast dispatch message; and in response: each particular member of the plurality of other members raising a priority level of a process associated with said each particular member to that corresponding to the gang priority level in order to cause an approximate or actual simultaneous response to the gang dispatch message on each of the plurality of other gang members."

Group: claims 1-19.

Representative claim for this group: claim 1.

Claim 1 (as well as claims 2-19) stands rejected as being indefinite for the use of the word "approximate" in the above-referenced claim limitation. First, breadth of a claim is not to be equated with indefiniteness. In re Miller, 441 F.2d 689, 169 USPQ 597 (CCPA 1971). In fact, MPEP § 2173 only requires that the claims define the patentable subject matter with a reasonable degree of particularity and distinctness. Some latitude in the manner of expression and the aptness of terms should be permitted even though the claim language is not as precise as the examiner might desire. MPEP § 2173. Definiteness of claim language must be analyzed, not in a vacuum, but in light of:

- (A) The content of the particular application disclosure;
- (B) The teachings of the prior art; and
- (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made. *Id.*

In reviewing a claim for compliance with 35 U.S.C. 112, second paragraph, the examiner must consider the claim as a whole to determine whether the claim apprises one of ordinary skill

in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. 112, second paragraph, by providing clear warning to others as to what constitutes infringement of the patent. *Id.* Again, breadth of a claim is not to be equated with indefiniteness. MPEP § 2173.04 citing *In re Miller*, 441 F.2d 689, 169 USPQ 597 (CCPA 1971).

Appellants respectfully traverse these § 112 rejections as one skilled in the art understands the meaning of claim 1 in light of the specification and the claim language itself. In one embodiment, the gang members are asynchronous systems, with a teaching of Appellants' disclosure and claimed invention how to cause these gang members to perform some function at approximately or actually the same instant in time. The phrase "to cause an approximate or actual simultaneous response to the gang dispatch message on each of the plurality of other gang members" could also be considered to be simply a stated purpose or result of the use of the multicast message sent to the multiple gang members and the raising of the priority level in response to the received multicast message as disclosed in Appellant's original disclosure. One skilled in the art, after reading the disclosure would understand that there are physical propagation delays in getting the multicast message to the various gang members (e.g., on different line cards of a router, on different appliances, etc.), as well as processing delays when gang members are running an independent schedulers such that it is not possible to guarantee that the operation associated with the multicast dispatch message is performed on each gang member exactly simultaneously (e.g., starting and ending at the exact same time to the infinitesimal fraction of a second). One skilled in the art understands that the result of the uses of a multicast message and changing the priority level of a process to execute the operation would produce an approximate or actual simultaneous response to the gang dispatch message, and therefore, the claim is not indefinite.

Moreover, Appellants position is consistent with case law when the term substantially is used with another term to describe a particular characteristic of the claimed invention. In *re Mattison*, 509 F.2d 563, 184 USPQ 484, 487 (CCPA 1975), the court held that the limitation "to substantially increase the efficiency of the compound as a copper extractant" was definite

in view of the general guidelines contained in the specification. In *Andrew Corp. v. Gabriel Electronics*, 847 F.2d 819, 6 USPQ2d 2010, 2013 (Fed. Cir. 1988), the court held that the limitation “which produces substantially equal E and H plane illumination patterns” was definite because one of ordinary skill in the art would know what was meant by “substantially equal.” Therefore, the use of the term “substantial” or “approximate” does not *per se* render a claim indefinite.

For at least these reasons, neither the record nor the law supports the Office's position that one of ordinary skill in the art would not know when the gang members, in response to a same multicast gang dispatch message and changing their respective priority of their processes accordingly, are caused to approximately or actually simultaneous respond to the gang dispatch message. In fact, the actual or simultaneous response is a result of each of the gang members receiving the same multicast gang dispatch message and changing their priorities accordingly as taught by Appellants' original disclosure. For at least these reasons, Appellants respectfully request the Board reverse the § 112 rejection of claim 1 (as well as the § 112 rejections of claims 1-19).

(3) Whether claims 1, 8 and 12 (all three pending independent claims) are anticipated under 35 USC § 102(e) as being anticipated by Chen, US Patent Application 09/989,474, published as US Patent Application Publication 2003/0097425 A1.

The Office fails to present a *prima facie* anticipation rejection under 35 USC § 102(e) of claims 1, 8, and 12 based on Chen, as Chen fails to teach the recited limitations of: in response to a received multicast dispatch message, raising a priority level of a process associated with said each particular other gang member to that corresponding to the gang priority level, specified in the received multicast dispatch message, in order to cause an approximate or actual simultaneous response to the gang dispatch message on each of the plurality of other gang members.

Group: claims 1-19 (all pending claims).

Representative claim for this group: claim 1.

Claim 1 requires that a first gang member send a multicast dispatch message to the plurality of other members, with the multicast dispatch message including an indication of a gang priority level; and then in response to a received multicast dispatch message, raising a priority level of a process associated with said each particular other gang member to that corresponding to the gang priority level, specified in the received multicast dispatch message, in order to cause an approximate or actual simultaneous response to the gang dispatch message on each of the plurality of other gang members.

As a threshold matter, in rejecting claim 1, the Office cites paragraphs [0046] and [0087] of Chen for these teachings. However, the teachings in these paragraphs are directed to independent events: the propagation of multicast discovery requests in paragraph [0046], and the shutting down state in paragraph [0087]. In rejecting of claim 1's limitation of the plurality of other gang members receiving the multicast dispatch message, the Office cites only paragraph [0046] for this teaching. Chen neither teaches nor suggests that a multicast discovery request includes a priority indication; rather there are only two mentions of the word

"priority" or a variant thereof disclosed in Chen, with those being the discussion of FIG. 6f in paragraph [0087] ("the SDAx multicasts an SDA_WILLING message with zero (0) priority") and in FIG. 6f ("send SDA_WILLING with 0 priority"). The Office relies on paragraph [0067] in rejecting the limitation of: in response to a received multicast dispatch message, raising a priority level of a process associated with said each particular other gang member to that corresponding to the gang priority level, specified in the received multicast dispatch message, in order to cause an approximate or actual simultaneous response to the gang dispatch message on each of the plurality of other gang members. Therefore, the Office's statement of rejection is incoherent and violates basic antecedent basis claim construction principles as it fails to equate multiple occurrences of claim element with a same element/teaching of Chen. For at least this reason, the Office action fails to present a *prima facie* rejection of claim 1.

Additionally, Chen neither teaches nor suggests the limitations of: in response to a received multicast dispatch message, raising a priority level of a process associated with said each particular other gang member to that corresponding to the gang priority level, specified in the received multicast dispatch message, in order to cause an approximate or actual simultaneous response to the gang dispatch message on each of the plurality of other gang members. In rejecting these limitations, the Office relies upon the only two mentions of the word "priority" or a variant thereof disclosed in Chen, with those being the discussion of FIG. 6f in paragraph [0087] ("the SDAx multicasts an SDA_WILLING message with zero (0) priority") and in FIG. 6f ("send SDA_WILLING with 0 priority"). The Office action states that "[i]n order to perform an operation after receiving the multicast message, the device inherently has to raise the priority of the responding process to the zero priority, which is the highest priority possible, to ensure the device to [sic] responds." This statement in the Office action violates the basic principle of inherency (in which something *must occur*, not that it *might occur*). Moreover, the Office's assertions are believed to be factually incorrect given a basic understanding of Microsoft messaging (and Chen is assigned to Microsoft Corporation per the face of the its publication).

It is well-settled law that inherent means it *must* occur. The fact that a certain result or characteristic *may* occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (citations omitted)(*emphasis added*). As with most in inherency arguments in this technology field, there is an alternative implementation to that stated in the Office action. More specifically, multiple queues for storing packets can be used at the egress and/or ingress of a device, with each of the queues representing packets of a particular priority level. Queues with a higher priority level are serviced first. For at least this reason, there is an alternative implementation to that presented in the Office action, and therefore, the Office's inherency argument is flawed. Although not required for a successful traversal of the rejection, Appellants believe the use of multiple queue is how Microsoft's systems actually function.

For at least these reasons, the Office fails to establish a prima facie anticipatory rejection of claim 1 (nor of claims 8 and 12). Additionally, for at least these reasons, Chen neither teaches nor suggests all of the limitations of claim 1 (nor of claims 8 and 12). For at least these reasons, Appellants respectfully request the Board reverse the § 102(e) rejections of the claims based on Chen.

(4) Whether claims 1-19 (all pending claims) are unpatentable under 35 USC § 103(a) over Sikdar, US Patent 6,724,729, in view of Boudnik et al., US Patent 7,207,040.

The Office fails to establish a *prima facie* rejection of any of claims 1-19, as the prior art of record, alone or in combination, neither teaches nor suggests all claim limitations.

Group: claims 1-19 (all pending claims).

Representative claim for this group: claim 1.

Claim 1 stands rejected based on the combination of Sikdar in view of Boudnik et al. Office action, June 11, 2008, pp. 5-8 ("Office action"). The Office action asserts that Sikdar substantially teaches the limitations of claim 1, with the exception of the recite use of priority, and then relies on Boudnik et al. for teaching of changing priority in a distributed computing environment. Appellants respectfully submit that a combination of such references (assuming it is proper for the sole purpose of this Appeal Brief) neither teaches nor suggests all of the claim limitations of any pending claim.

The burden is on the Office Action to establish a *prima facie* case of obviousness, and obviousness under 35 USC § 103(a) requires "the prior art reference (or references when combined) must teach or suggest all the claim limitations." The teaching or suggestion to make the claimed combination and the reasonable expectation of success cannot be based on applicant's disclosure." *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991)(emphasis added).

Appellants agree with the Office that Sikdar which teaches the triggering of Local Area Network (LAN) analyzers to initiate their packet capture or packet generation capability by receipt of a multicast packet by a specialized synchronization decoder circuit which produces local signals for triggering the packet capture, analysis and generation circuits. Office action at 6 ("then performing an operation associated with the multicast dispatch message at the gang priority level (Column 2, lines 5-9)"). Column 2, lines 5-9 state: "Responsive to the multicast information, the synchronization decoder circuit generates local signals. The synchronization decoder circuit transfers the local signals to one or more selected packet capture, analysis and

generation circuits (PCAGC's)." This is shown in FIG. 5, with this description repeated and expanded at Sikdar, col. 8, line 66 *et seq.* Referring to FIG. 5, shown are MAC controller 530 and Synchronizer Decoder Circuit 510 which receive packets from remote control link 420. Each of MAC Controller 530 and Synchronizer Decoder Circuit 510 has a different data link layer address so packets can be sent to a specified one of these devices. *Id.* at col. 9, lines 13-24. It is the Synchronizer Decoder Circuit 510 that receives the multicast packet and causes the synchronization among multiple PCAGC's, such as discussed in the following paragraph from Sikdar.

For selected synchronized analyzers 410, the synchronization decoder circuit 510 decodes 330 the multicast information. Responsive to the multicast information, the synchronization decoder circuit generates 340 local signals. The local signals 515 are shown in FIG. 5 as an output of the synchronization decoder circuit 510. The synchronization decoder circuit 510 transfers 350 the local signals 515 to one or more selected packet capture, analysis and generation circuits 520. For some embodiments, the local signals 515 include synchronization signals and control signals. Examples of local signals include a system reset signal, a receive enable signal, a transmit enable signal, a clear time stamp signal, and a remote trigger signal.

Id. at col. 9, lines 25-37.

In other words, Sikdar neither teaches nor suggests a process capable of multiple priority levels that is synchronized. Sikdar teaches that a Synchronizer Decoder Circuit 510 (of FIG. 5) receives a multicast packet and possibly generates a local signal 515 to trigger PCAGC 520. In fact, Appellants submit that Sikdar teaches away from such a multiple priority process as in order to work, the PCAGC's 520 are configured to be ready to capture or generate signals upon receipt of the trigger signal (e.g., the rising or falling edge of the trigger signal) generated by the Synchronizer Decoder Circuit 510 which directly receives the multicast packet without delay (i.e., it does not go through MAC controller 530 nor CPU 540). The operations of are very time sensitive and that is why the multicast packet is "intercepted" by the optimized Synchronizer Decoder Circuit 510 to generate the local triggering signal 515. There is no process capable of changing priority in Sikdar, nor is there a reason. (Appellants cannot even find an occurrence of

the word "priority" nor variant thereof anywhere in Sikdar.) In fact, such added overhead would degrade the performance of Sikdar, and probably render Sikdar unfit for its intended purpose of synchronized capture and/or generation of signals on a LAN.

The Office relies on Boudnik et al. for the teaching of "a change priority message that may be sent to tasks to change the tasks' priority level (Column 2, lines 35-60) for the purpose of priority control on distributed computing environments." Office action at 6. Appellants respectfully traverse this statement in the Office action as it is not accurate. Boudnik et al. teaches that a single change priority message may be used to change the priority of a single task. It neither teaches nor suggests that a change priority message (singular) can be sent to tasks (plural) to changes the tasks' (plural) priority level. In fact, Appellants can find no mention of the word "multicast" nor "broadcast" (as in multicast or broadcast packet) in Boudnik et al.; and the citation to which the Office relies uses the term "specific task" as in the priority value of a specific task (singular) is changed. The entire paragraph from Boudnik et al. relied upon by the Office is presented below.

"Broadly speaking, embodiments of the present invention address these needs by providing thread priority control within a multi-CPU computer. Providing a mechanism to reduce task conflicts caused by resource contention provides additional thread control. In one embodiment, a method is disclosed for providing thread priority control in a distributed computer system. The method includes executing at least one task on a server. Each task executed on the server includes a task identifier and a priority value. In addition, a change priority message, which includes a priority value and a task identifier, is received over a network. *In response, the priority value of a specific task having the same task identifier as the task identifier of the change priority message is set equal to the priority value of the change priority message. As a result, the specific task is executed at a priority level relative to the priority value of the specific task.* In one aspect, each task can include a change priority method, which functions to set the priority value of the task to a specific value and accepts a priority value as an argument. In this case, the change priority method can also communicate with a local Java Virtual Machine to adjust computer resource allocation. In addition, the change priority method of the task can be called using the priority value of the change priority message. Optionally, the server can be part of a server farm, which includes a plurality of servers controlled

using a control system server. In this case, the change priority message can be sent from a separate server on the server farm, from the control system server, or both."

Id. at col. 2, lines 32 to 59 (*emphasis added*). Moreover, Boudnik et al. teaches away from synchronization, in fact, it is trying to avoid synchronization which causes resource contention when parallel tasks attempt to access the same resource, such as described in the following two paragraphs from Boudnik et al., which come directly before the previous presented excerpt and the following are the "needs" addressed by the Boudnik et al.'s invention.

"Further, tasks often can be executed on a particular server in parallel without causing resource conflicts. However, if two tasks require the same system resource during parallel execution, resource contention problems can occur. For example, two audio testing tasks executing in parallel may attempt to utilize the same audio resource simultaneously. The resulting contention can cause problems and/or errors with the audio tasks.

In view of the foregoing, there is a need for systems and methods that allow thread priority control on distributed computing environments. That is, a need exists for systems and methods that allow control of computing resource allocation remotely. Further, the systems and methods should provide a mechanism to reduce resource contention problems that may occur when parallel tasks attempt to access the same resource.

SUMMARY OF THE INVENTION

Broadly speaking, embodiments of the present invention address these needs by providing thread priority control within a multi-CPU computer...

Boudnik et al. col. 2, lines 13-34.

For at least these reasons, Appellants respectfully submit the prior art of record, alone or in combination, neither teaches nor suggests all of the claim limitations of any pending claim. For example, the prior art of record, alone or in combination, neither teaches nor suggests the limitations of "sending a multicast dispatch message to the plurality of other members, [with] the multicast dispatch message including an indication of a gang priority level a multicast message including a priority." The Office relies on Boudnik et al. for this teaching, and Boudnik et al.

neither teaches nor suggests such a multicast dispatch message. Additionally, the prior art of record, alone or in combination, neither teaches nor suggests the limitations of "in response: each particular member of the plurality of other members raising a priority level of a process associated with said each particular member to that corresponding to the gang priority level in order to cause an approximate or actual simultaneous response to the gang dispatch message on each of the plurality of other gang members." Sikdar neither teaches nor suggests a process capability of multiple priority levels that is triggered by a multicast message. Finally, the Office's rationale for combining Sikdar with Boudnik et al. is that the inclusion of the priority level in a message and a process changing its priority level in response thereof is that "it allows for priority control on distributed computing environments." This rationale is *non sequitur* as there is no need within Sikdar for such priority control, and such modification of Sikdar would add overhead that would at least degrade the performance of Sikdar, and probably render Sikdar unfit for its intended purpose of synchronized capture and/or generation of signals on a LAN. Moreover, Boudnik et al. teaches that the purpose of changing a priority of a process is *to avoid synchronization* of processes and their contention for resources; and not *"to cause an approximate or actual simultaneous response to the gang dispatch message on each of the plurality of other gang members"* as recited in claim 1.

For at least these reasons, Appellants submit that the Office action fails to establish a *prima facie* rejection of claim 1 (nor of claims 2-19); and Appellants respectfully request the Board reverse all rejections of claims 1-19.

FINAL REMARKS. For at least these reasons, Appellants respectfully request all rejections be reversed, all claims be allowed, and the application be passed to issuance. All pending claims recite patentable subject matter, are supported by the originally filed disclosure, and the prior art of record neither teaches nor suggests all the elements/limitations of any pending claim. Therefore, all pending claims are believed to be allowable, and the application is considered in good and proper form for allowance. Appellants respectfully request all claim rejections be reversed and all claims be allowed. Additionally, Appellants request the Office withdraw all rejections and/or objections and allow the case in response to this reply to the final Office action.

Respectfully submitted,
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By 

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(viii) CLAIMS APPENDIX

1. A method for gang scheduling, the method comprising:

a first member of a gang recognizing an event, the gang including the first member and a plurality of other members; and in response to said recognition of the event, the first member sending a multicast dispatch message to the plurality of other members, the multicast dispatch message including an indication of a gang priority level; and

the plurality of other members receiving the multicast dispatch message; and in response: each particular member of the plurality of other members raising a priority level of a process associated with said each particular member to that corresponding to the gang priority level in order to cause an approximate or actual simultaneous response to the gang dispatch message on each of the plurality of other gang members, and then performing an operation associated with the multicast dispatch message in said process at the gang priority level.

2. The method of claim 1, wherein said performing the operation includes generating one or more results; and wherein said method comprises each particular member of the plurality of other members communicating its respective said one or more results to the first member.

3. The method of claim 2, wherein said operation includes collecting one or more statistics values and said one or more results includes said one or more statistics values.

4. The method of claim 1, wherein the multicast dispatch message includes a set of routing updates, and said operation includes updating a data structure with the set of routing updates.

5. The method of claim 1, wherein the multicast dispatch message includes a fault indication, and said operation includes updating configuration or routing information in response to the fault indication.

6. The method of claim 1, wherein the event includes the detection of a fault, and the operation is a corrective measure associated with the fault.

7. The method of claim 1, comprising raising the priority level of the first member to the gang priority level before said sending the multicast dispatch message.

8. An apparatus for gang scheduling, the apparatus comprising:

means for maintaining gang membership of a scheduling gang, said gang membership including a plurality of other gang members;

means for dispatching and communicating gang dispatch messages to the plurality of other gang members, said gang dispatch messages including a scheduling priority level; and

wherein each of the plurality of other gang members includes: means for receiving a particular gang dispatch message; and means for: in response to said receipt of said particular gang dispatch message: modifying a priority level of a process to the scheduling priority level included in said received gang dispatch message in order cause an approximate or actual simultaneous response to the gang dispatch message on each of the plurality of other gang members , and then performing an operation corresponding to said particular gang dispatch message in the process at the scheduling priority level included in said particular gang dispatch message.

9. The apparatus of claim 8, wherein said means for dispatching and communicating gang dispatch messages includes means for performing reliable group communication.

10. The apparatus of claim 9, wherein said means for reliable group communication includes means for acknowledging less than all of a series of gang dispatch messages.

11. The apparatus of claim 9, wherein said means for reliable group communication includes means for performing immediate and delayed acknowledgement of received gang dispatch messages.

12. An apparatus including one or more processing elements and memory, wherein said memory stores one or more instructions that, when executed by said one or more processors, implements processes comprising:

a first member of a gang; and

a plurality of other members of the gang;

wherein the first member is configured to recognize an event, and in response, send a multicast dispatch message to the plurality of other members, the multicast dispatch message including an indication of a gang priority level; and

wherein the plurality of other members are each configured to receive the multicast dispatch message, and in response to said receipt of the multicast dispatch message: to change a processing priority level of a process to that corresponding to the gang priority level including in the multicast dispatch message in order to cause an approximate or actual simultaneous response to the gang dispatch message on each of the plurality of other gang members, and then to perform an operation associated with the multicast dispatch message in the process at the gang priority level.

13. The apparatus of claim 12, wherein said performing the operation includes generating one or more results; and wherein said each of the plurality of other members is configured to communicate said one or more results to the first member.

14. The apparatus of claim 13, wherein said operation includes collecting one or more statistics values and said one or more results includes said one or more statistics values.

15. The apparatus of claim 12, wherein the first member is configured to raise its priority level to at least the gang priority level in response to recognizing the event and before sending the multicast dispatch message.

16. The apparatus of claim 12, wherein each of the plurality of other members of the gang are included on different line cards of a packet switching system.

17. The apparatus of claim 12, wherein the multicast dispatch message includes a set of routing updates, and said operation includes updating a data structure with the set of routing updates.

18. The apparatus of claim 12, wherein the multicast dispatch message includes a fault indication, and said operation includes updating configuration or routing information in response to the fault indication.

19. The apparatus of claim 12, wherein the event includes the detection of a fault, and the operation is a corrective measure associated with the fault.

(ix) EVIDENCE APPENDIX

NONE.

(x) RELATED PROCEEDINGS APPENDIX

NONE.